CLAIMS

- 1. A distributor characterized by comprising:
- an oscillator which outputs electromagnetic
- 3 waves;

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- a first square waveguide to be connected to
- 5 said oscillator; and
- 6 a second square waveguide having a plurality
- 7 of openings,
- 8 wherein said first square waveguide and said
- 9 second square waveguide communicate with each other
- 10 through a communication hole formed in one narrow wall
- 11 of each of said first square waveguide and said second
- 12 square waveguide.
 - 2. A distributor according to claim 1,
- 2 characterized in that said first square wavequide
- 3 comprises a guide wall which projects from the other
- 4 narrow wall toward the communication hole and guides the
- 5 electromagnetic waves propagating in said first square
- 6 waveguide toward the communication hole.
 - 3. A distributor according to claim 2,
- 2 characterized in that the electromagnetic waves which
- 3 are reflected by said guide wall and travel in an
- 4 opposite direction in said square waveguide and the
- 5 electromagnetic waves which are reflected by an end of
- 6 said first square waveguide cancel each other.
 - 4. A distributor according to claim 3,

- 3 said guide wall is arranged to oppose the 4 communication hole, and 5 said end of said first square waveguide is 6 arranged at a position away from said guide wall by an 7 integer multiple of substantially 1/2 a tube wavelength 8 of said first square waveguide. 5. A distributor according to claim 1, 2 characterized in that said second square waveguide 3 comprises a conductive column which is arranged in the 4 vicinity of the communication hole and extends between 5 opposing wide walls. A demultiplexer according to claim 1, 2 characterized in that said first square waveguide and 3 said second square waveguide have different relative dielectric constants. 7. A plasma processing system characterized by 2 comprising: 3 a stage to place a target object thereon;
 - a processing vessel to accommodate said stage;
 - 5 an antenna assembly having a plurality of
 - 6 radiation waveguides with slots; and
 - 7 a demultiplexer which distributes
 - 8 electromagnetic waves to said radiation waveguides,
 - 9 said demultiplexer comprising
 - 10 an oscillator which outputs the
 - 11 electromagnetic waves,

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characterized in that

- a first square waveguide to be connected to
- 13 said oscillator, and

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- 14 a second square waveguide to be connected to
- 15 one end of each of said radiation waveguides through a
- 16 plurality of openings formed therein,
- 17 wherein said first square waveguide and said
- 18 second square waveguide communicate with each other
- 19 through a communication hole formed in one narrow wall
- 20 of each of said first square waveguide and said second
- 21 square waveguide.
 - 8. A plasma processing system according to claim
 - 2 7, characterized in that each of said radiation
 - 3 waveguides has a standing wave driving slot, on the
 - 4 other end of a side wall thereof, to be driven by
 - 5 standing waves which are formed of traveling waves
 - 6 traveling from said one end toward said other end and
 - 7 reflected waves reflected by said other end toward said
 - 8 one end.
 - 9. A plasma processing system according to claim
 - 2 8, characterized in that said standing wave driving slot
 - 3 is formed at a position away from said other end toward
 - 4 said one end by a natural number multiple of
 - 5 substantially 1/2 a tube wavelength of a corresponding
 - 6 one of said radiation waveguides.
 - 10. A plasma processing system according to claim
 - 2 8, characterized in that each of said radiation
 - 3 waveguides comprises a reflecting member which is

- 4 arranged on a side of said one end, when seen from said
- 5 standing wave driving slot, and reflects part of the
- 6 traveling waves toward said one end to cancel the
- 7 reflected waves which are reflected by said other end or
- 8 said standing wave driving slot.

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- 11. A plasma processing system according to claim
- 2 10, characterized in that said reflecting member is
- 3 arranged at a predetermined position between a center
- 4 position of said standing wave driving slot and a
- 5 position away from the center position toward said one
- 6 end by substantially 3/2 the tube wavelength of said
- 7 corresponding one of said radiation waveguides.
 - 12. A distributing method characterized by
- 2 comprising the steps of:
- 3 introducing electromagnetic waves propagating
- 4 in a first square waveguide into a second square
- 5 waveguide through a communication hole formed in one
- 6 narrow wall of each of the first square waveguide and
- 7 the second square waveguide; and
- 8 distributing the electromagnetic waves
- 9 introduced into the second square waveguide to a
- 10 plurality of waveguides through a plurality of openings
- 11 formed in the second square waveguide.
 - 13. A plasma processing method characterized by
 - 2 comprising the steps of:
 - 3 introducing electromagnetic waves propagating
 - 4 in a first square waveguide into a second square

5 waveguide through a communication hole formed in one 6 narrow wall of each of the first square wavequide and 7 the second square waveguide; 8 distributing the electromagnetic waves introduced into the second square waveguide to a 9 10 plurality of radiation waveguides through a plurality of 11 openings formed in the second square waveguide; 12 supplying the electromagnetic waves introduced 13 into the radiation waveguides to a processing vessel 14 through a slot formed in each of the radiation 15 wavequides; and 16 processing a target object placed in the 17 processing vessel utilizing a plasma which is generated 18 by the electromagnetic waves supplied to the processing 19 vessel. 14. A process for fabricating an LCD, 2 characterized by comprising the steps of: 3 introducing electromagnetic waves propagating 4 in a first square waveguide into a second square 5 waveguide through a communication hole formed in one 6 narrow wall of each of the first square waveguide and 7 the second square waveguide; 8 distributing the electromagnetic waves 9 introduced into the second square waveguide to a 10 plurality of radiation waveguides through a plurality of 11 openings formed in the second square waveguide; 12 supplying the electromagnetic waves introduced - 31 ~

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- 13 into the radiation waveguides to a processing vessel
- 14 through a slot formed in each of the radiation
- 15 waveguides; and
- subjecting a surface of an LCD substrate
- 17 arranged in the processing vessel to a process such as
- 18 etching, ashing, oxidation, nitridation, or CVD
- 19 utilizing a plasma which is generated by the
- 20 electromagnetic waves supplied to the processing vessel.